UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/518,140	12/10/2004	Christophe Janneteau	CR00568P	5279

22917 7590 05/05/2008

MOTOROLA, INC.
1303 EAST ALGONQUIN ROAD
IL01/3RD
SCHAUMBURG, IL 60196

EXAMINER	
LAI, ANDREW	

ART UNIT	PAPER NUMBER
2616	

NOTIFICATION DATE	DELIVERY MODE
05/05/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

Docketing.Schaumburg@motorola.com
APT099@motorola.com

Office Action Summary	Application No.	Applicant(s)	
	10/518,140	JANNETEAU ET AL.	
	Examiner	Art Unit	
	ANDREW LAI	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 February 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12 and 27-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12 and 27-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 27 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 27 recites, in the preamble, “A data network including a first communication node for transmitting a data packet on a communication path from a first communication node to a second communication node..." It is not clear whether the second "a first" herein is the same as the first "a first". Also, in the main body of the claim, the first clause recites "a second communication node that determines... and sends a route message to a first communication node…”, and the second clause recites “a first communication node that generates…”. Again, it is not clear the repeatedly recited "a first” and “a second" communication node are the same as the "a first" and "a second" node in the preamble. Correction is required. Meanwhile, in light of the Specification, Examiner takes the position that all of the terms of “a first” and “a second” communication node, except the first time mentioned in the preamble, be changed to "said/the first" and "said/the second".

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-6, 10-12, 27, 29 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams et al (US 5,883,891, Williams hereinafter) in view of Ernst ("Network Mobility Support in IPv6", a thesis presented in fulfillment of the requirement for the degree of Doctor of Philosophy to the Department of Mathematics and Computer Science at Universite Joseph Fourier, France, October 19, 2001).

- **With respect to Independent claims 1 and 27**

Williams discloses "method and apparatus for increased quality of voice transmission over the Internet" (col. 1 lines 1-3) "to reduce unpredictable delays due to variation in loading, routing and other factors" (Abstract lines 2-4) comprising the following features:

Regarding claim 1, *a method of transmitting a data packet* ("permit computer users to talk to each other using voice communication, and their computers, over the Internet"), col. 1 lines 13-15, wherein "the digital data is organized into a bitstream consisting of packets", col. 1 lines 21-22) *on a communication path* ("over various types of communication channels", col. 1 lines 17-18, and also fig. 1B, e.g., "route A") *from a first communication node* ("source node", col. 2 line 54, or fig. 1B "host 15") *to a second*

communication node (“destination node”, col. 2 lines 55-56, or fig. 1B “host 20”) *in a network* (fig. 1A “internet 10"), *wherein the second communication node* (fig. 1B “host 20”) *is connected to the data network through at least one intermediary router* (it is obvious to one skilled in the art, referring to fig. 1B, that said "host 20" has to be *connected to the data network*, “internet 10”, *through intermediary routers* because it is communicating with “host 15” via various “route A, B, C, D, E” etc. as depicted in fig. 1B), *the method comprising the steps of:*

the second communication node (fig. 1B “host 20") *determining a care-of route* (“echo route packet”, col. 4 line 24, and “unique routes could be derived from routes obtained by using echo route packets”, col. 8 lines 53-54) *including a list of addresses of the at least one intermediary router between said data network and said second communication node* (“when the echo route packet is received by the destination node, it is transmitted back to the source node", col. 8 lines 10-11, and see in fig. 5, which "illustrates an echo route packet which has traveled through a route and has recorded its intermediate node addresses and times", col. 4 lines 24-26, noting that said “intermediate node” comprises “routers” as recited col. 8 lines 17-18, “’strict source routing’ in which the header lists all intermediate nodes (routers)“, and see further that said echo route packet “include a list of nodes in sequence, that best determines the route over which the packet is transmitted", col. 8 lines 66-67);

the second communication node sending a route message to the first communication node without any explicit request for said route message being received by the said second communication node from the first communication node (“the echo

route packet is sent by the source node to the destination node (destination host server) to collect the node IDs along its route", col. 7 line 66 - col. 8 line 1, noting *said* "echo route packet" *being received by the* "destination node" *from the* "source node" *without any explicit request* by the "destination node" because it is the "source node" that proactively initiates the "echo route packet"), *wherein said route message* ("echo route packet") *includes the care-of route* (again see fig. 5);

the first communication node ("source node") *generating a preferred communication path* ("select the best available route", col. 3 line 17) *in response to said care-of route* ("echo route packet") *received from said second communication node* ("When the source node receives the echo route packet, it extracts the route", col. 8 lines 13-14, and "The source node compares a number of returned echo packets which have been transmitted over different routes, to select the best available route", col. 3 line 14-17); *and*

the first communication node ("source node", e.g. fig. 1B "host 15") *transmitting said at least one data packet* ("packets use IP", col. 5 line 4) *from said first communication node to said second communication node* ("destination node", e.g. fig. 1B "host 20") *via said preferred communication path* (see fig. 1B depicting data routes between "host 15" and "host 20" and see the discussion immediately above for *preferred communication path* comprising "the best available route" among the routes in fig. 1B).

Regarding claim 27, *a data network* (figs. 1A and 1B) *including a first communication node* ("source node", col. 2 line 54, or fig. 1B "host 15") *for transmitting*

a data packet (“permit computer users to talk to each other using voice communication, and their computers, over the Internet”), col. 1 lines 13-15, wherein “the digital data is organized into a bitstream consisting of packets", col. 1 lines 21-22) *on a communication path* ("over various types of communication channels”, col. 1 lines 17-18, and also fig. 1B, e.g., "route A") *from the first communication node* (e.g. “host 15”) *to a second communication node* (“destination node”, col. 2 lines 55-56, or fig. 1B “host 20”), *where the second communication node* (fig. 1B “host 20”) *is in a network* (figs. 1A and 1B depicting “host 20” in *a network* comprising the host itself, the “RBOC central office 22”) *connected to the data network through at least one intermediary router* (it is obvious to one skilled in the art, referring to fig. 1B, that said "host 20" has to be *connected to the data network*, “internet 10”, *through intermediary routers* because it is communicating with “host 15” via various “route A, B, C, D, E” etc. as depicted in fig. 1B), *the data network* (fig. 1A “Internet 10") *comprising:*

said second communication node (fig. 1B “host 20") *determines a care-of route* (“echo route packet”, col. 4 line 24, and “unique routes could be derived from routes obtained by using echo route packets”, col. 8 lines 53-54) *including a list of addresses of the at least one intermediary router between said data network and said second communication node* (“when the echo route packet is received by the destination node, it is transmitted back to the source node", col. 8 lines 10-11, and see in fig. 5, which "illustrates an echo route packet which has traveled through a route and has recorded its intermediate node addresses and times", col. 4 lines 24-26, noting that said “intermediate node” comprises “routers” as recited col. 8 lines 17-18, “’strict source

routing' in which the header lists all intermediate nodes (routers)", and see further that said echo route packet "include a list of nodes in sequence, that best determines the route over which the packet is transmitted", col. 8 lines 66-67), *and sends a route message to the first communication node without any explicit request for said route message being received by the said second communication node from the first communication node* ("the echo route packet is sent by the source node to the destination node (destination host server) to collect the node IDs along its route", col. 7 line 66 - col. 8 line 1, noting the "echo route packet" *being received by the* "destination node" *from the* "source node" *without any explicit request* by the "destination node" because it is the "source node" that proactively initiates the "echo route packet"), *wherein said route message* ("echo route packet") *includes the care-of route* (again see fig. 5); *and*

said first communication node ("source node") *that generates a preferred communication path* ("select the best available route", col. 3 line 17) *in response to said care-of route* ("echo route packet") *received from said second communication node* ("When the source node receives the echo route packet, it extracts the route", col. 8 lines 13-14, and "The source node compares a number of returned echo packets which have been transmitted over different routes, to select the best available route", col. 3 line 14-17); *and transmits said at least one data packet* ("packets use IP", col. 5 line 4) *to said second communication node* ("destination node", e.g. fig. 1B "host 20") *via said preferred communication path* (see fig. 1B depicting data routes between "host 15" and

"host 20" and see the discussion immediately above for *preferred communication path* comprising "the best available route" among the routes in fig. 1B).

Williams does not disclose, regarding claims 1 and 27, *second node* in a *mobile* network and *intermediary routers* comprise a *mobile* router.

Ernst discloses a work "devoted to the study of network mobility support in IPv6" (Abstract line 1) comprising:

Regarding claims 1 and 27, a second node in a *mobile* network ("offer permanent and un-interrupted Internet connectivity and optima routing to all mobile network nodes, while scaling to a large number of correspondent nodes and a large number of mobile networks", p85 Chapter paragraph 1 lines 2-3, of which fig. 3.5 depicts an example of an "MN", mobile network, moving from its home address "MN_{IP}" to its care-of address "MN_{coa}"); and

intermediary routers comprise a *mobile* router (refer to fig. 7.5, "VMN" (visiting mobile node) registers with its "HA" (home agent) or "CN" (correspondent node) via an "MR" (mobile router), and receives message or "payload", fig. 7.6 message path 3, through the "MR").

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the network of Williams by adding the mobile network and associated mobile routers of Ernst to Williams in order to provide dynamic IP mobility wherein "anyone would benefit from the same social and professional environment without restriction of current geographical location" (Ernst, p.1 "Motivations and Objectives" 1st paragraph lines 3-4)

- **With respect to Dependent claims**

Regarding claim 2, Williams discloses *said step of transmitting includes routing said at least one data packet via a plurality of routers* (see the citation above for claim 1 regarding “intermediate nodes” being "routers") *identified by said intermediary addresses in said network* ("the header of each pacekt is formatted by the source no“e to include a list of [intermediate] nodes in sequence, that best determines the route with the packet is transmitted", col. 8 lines 65-67).

Williams does not but Ernst does disclose *mobile* network and *mobile* routers (see the citation above for claim 1) *wherein said mobile network supports netsted network mobility operation* (see Ernst p89 subsection “7.1.3.1 Nested mobility” and see again fig. 3.5 depicting an example of an “MN”, mobile network, moving from its home address “MN_{IP}” to its care-of address "MN_{coa}”).

Regarding claim 3, Williams discloses *said network operates in accordance with an IPv4 specification* ("The packets use IP (Internet Protocol) addresses (header) which are 32 bit long", col. 5 lines 4-5, noting it's well known in the art 32 bit long IP addresses are of IPv4). Williams does not but Ernst does disclose *mobile network* (see discussion for claim 1 above) *in accordance with an IPv6 specification* (“we propose network mobility support extension to Mobile IPv6", p85 "Proposed Mobile IPv6 Extension", 1st paragraph 1st line).

Regarding claim 4, Williams does not but Ernst does disclose *said first communication node is a correspondent node of the said second communication node and/or said second communication node is a mobile network node* (p90 fig. 7.6

depicting “CN”, correspondent node, sending “payload” to “VMN too.foo”, which “VMN” indicates visiting *mobile node*).

Regarding claim 5, Williams discloses *sending a care-of-route message* (“echo route packet" cited for claim 1), *by a plurality of communication node in the network, that includes route information related to communication nodes attached to said second communication node, so that a communication path to an intended recipient can be determined* (“The echo route packet is sent by the source node to the destination node (destination host server) to collect the node IDs along its route. As that packet traverses the Internet, each [intermediated] node along the route inserts its IP address and a time stamp”, col. 7 line 66 – col. 8 line 3), as can be seen clearly hereinabove, when the “echo route packet" reaches the destination node, it will *include route information related to communication nodes attached to said second communication node,* which then is effectively the same as the *care-of-route message* of present Application in light of the Specification). Williams does not but Ernst does disclose *mobile* network (see citation for claim 1 above) and said message being sent as an *advertising message* (see Ernst "Neighbor Advertisement: used to ... and to advertise a new link-layer address”, p20 subsection “2.2.3 Neighbor Discovery” 3rd paragraph, and “Router Advertisements used by routers to advertise their presence", section 2.2.3 paragraph 5).

Regarding claim 6, Williams discloses *said list of the plurality of intermediary addresses* (“echo route packet” received by “source node”) *includes address of one or more routers above the second communication node in a route hierarchy for delivering said data packet to an intended recipient* (“the header of each packet is formatted by the

source node to include a list of nodes in sequence, that best determines the route over which the packet is transmitted [to the destination node]", col. 8 lines 65-67) *and includes a care-of address of the second communication node itself* (it is obvious to one skilled in the art that above said "echo route packet" received by "source node" will have to contain the *care-of address of the second communication node*, or "destination node", otherwise packets from the "source node" would not be able to reach the "destination node" because the former uses the addresses in the "echo route packet" to send packets to the latter). Williams does not but Ernst does disclose *the second communication node is a mobile node* (see citation for claim 1 above). It should be noted that Erns also discloses *includes addresses of one or more mobile routers above the second communication node and care-of address of the second communication node itself* ("the Routing Extension header must be filled in the right order so that packets are first routed to the MR_{coa}, to the VMN_{coa}", p91 1st paragraph lines 4-5, wherein MR_{coa} is mobile router's care-of-address and VMN_{coa} the visiting mobile node's care-of-address).

Regarding claim 10, Williams discloses *sending periodically said route advertising message to all or a selected number of communication nodes in the network* ("Echo route packet packets are sent to the destination node by the source node on a regular interval", col. 8 lines 8-9) and said route advertising message being *care-of route messages* (see citation for claim 5 above). Williams does not but Ernst does disclose destination node in *mobile* network (see discussion above for claim 1).

Regarding claim 11, Williams does not but Ernst does disclose *sending a mobile network prefix advertisement message by a mobile router at a top of a routing hierarchy in the mobile network to advertise said mobile network prefix* ("Router Advertisements used by routers to advertise their presence... They provide a list of prefixes", p20 subsection "2.2.3 Neighbor Discovery" paragraph 5); *and*

determining by communication nodes in the same mobile network that they are located within the sending mobile router's mobile network ("The MN [mobile node] establishes the biding between the current *RCoA* and the *LCoA* with the MAP [mobility anchor point or mobile router]", p36 subsection "3.2.1 Basic Mode" paragraph 1 lines 4-5, wherein *RCoA* is the care-of-address of the router (or MAP) and *LCoA* the care-of address of the MN).

Regarding claim 12, Williams does not but Ernst does disclose *sending an extended binding update message containing route information only to communication nodes outside of the sending communication node's mobile network* ("extends Mobile IPvv6 and separates Local-Area Mobility from Wide-Area mobility. The main benefit of this proposal is to render Local-Area Mobility transparent to CNs", p35 subsection "3.1.2 IETF Hierarchical Mobile IPv6" paragraph 1 lines 2-3).

Regarding claim 29, Williams discloses *wherein the sending step includes the second communication sending route message* (sending of "echo route packet" by "destination node" to "source node" discussed above for claim 1) *when it detects that a new communication is started with the first communication node* (note that, as discussed for claim 1 above, the sending of the "echo route packet" from the

"destination node" to the "source node" is prompted by the "source node" initiating the "echo route packet", as also discussed for claim 1 above, which effectively lets the "destination node" *detects a new communication is started*).

Regarding claim 33, Williams discloses *wherein the generating step generates the preferred communication path based on at least the care-of route* ("echo route packet") *received from the second communication node* ("destination node") *and a second dare-of route relating to the first communication node that includes a list of router addresses between the first communication node and the data network* ("When the source node receives the echo route packet, it extracts the route", col. 8 lines 13-14, and "The source node compares a number of returned echo packets which have been transmitted over different routes, to select the best available route", col. 3 line 14-17, noting that such "select best available route" will have to *includes a list of router addresses between the* "source node" *and the data network*, otherwise subsequent packets won't be able to be transmitted from the "source node" to the "destination node", especially on the "nest available route"). Williams does not but Ernst does disclose said routers comprise *mobile* routers (see discussion above for claim 1).

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Williams in view of Ernst, as applied to claim 5 above, and further in view of Inoue et al (US 6,587,882, Inoue hereinafter).

Williams in view of Ernst discloses claimed limitations in section 4 above including Williams disclosing *transmission of one or more care-of route messages* ("echo route packet"), *containing route information of one or more IP addresses, from*

adjacent communication nodes ("As that packet traverses the Internet, each [intermediate] node along the route inserts its IP address and a time stamp", col. 7 line 66 - col. 8 line 3) and Ernst disclosing said message in a form of *advertisement* (see Ernst "Neighbor Advertisements: used to … and to advertise a new link-layer address", p20 subsection "2.2.3 Neighbor Discovery" 3rd paragraph, and "Router Advertisements used by routers to advertise their presence", said section 2.2.3 paragraph 5).

Williams in view of Ernst however does not disclose *requesting* said transmission of care-of route advertisement message *when said second communication node moves to a new location within the mobile network.*

Inoue discloses "a mobile IP communication scheme in which a visited site or nearby network of a mobile computer is utilized as a temporal home of a mobile computer" (Abstract lines 1-3 and see fig. 1, e.g., "network 1-1" with "MA [mobile agent] 5" and "MN [mobile computer node] 2") comprising performing network configuration acquisition *when said second communication node moves to a new location within the mobile network* (refer to fig. 11 and see, first, "when the registration message is accepted, the query message for the network configuration information of this visited site network is sent to the mobile computer management server 5", col. 8 lines 53-56, and further fig. 12 step S11 "care-of-address acquisition processing", step S12 "processing for judging whether it is in the same subnet as MA or not", step S13 "same subnet" "YES", and then step 16 "network configuration information of visited site network acquisition processing").

It would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the method of Williams by adding Inoue's feature of the network configuration acquisition upon registration to Williams in order to provide a more robust mechanism for mobility wherein "it is possible to construct a mobile IP communication environment in which a visited site network or a nearby network is regarded as a home network (Inoue col. 3 lines 38-40) which would avoid the "need for making an extra setting … disadvantageous from a viewpoint of the performance of packet exchange with the home network" (col. 3 lines 26-29).

6. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams in view of Ernst, as applied to claim 5 above, and further in view of Baba et al (US 6,799,240, Baba hereinafter).

Williams in view of Ernst discloses claimed limitations in section 4 above including Williams disclosing:

Regarding claims 8 and 9 *care-of route messages* ("echo route packet") and Ernst disclosing said message in a form of *advertisement* (see Ernst "Neighbor Advertisements: used to … and to advertise a new link-layer address", p20 subsection "2.2.3 Neighbor Discovery" 3rd paragraph, and "Router Advertisements used by routers to advertise their presence", said section 2.2.3 paragraph 5).

Ernst further discloses the following features:

Regarding claim 8, *extracting intermediary route messages from said route information in said care-of route advertising messages at a communication node* ("neighbor Advertisements: used to respond to Neighbor Solicitations and to advertise a

new link-layer address", p20 subsection 2.2.3 paragraph 3, which operation as a response to Neighbor Solicitations will necessarily prompt the solicitor node to extract the link-layer address as *intermediary route message*).

Regarding claim 9, *appending a route message of the communication unit to said list of intermediary routes in said care-of route advertising message at said communication node* (see "The Hop-by-Hop Options Header carries additional information that must be processed by each intermediate router", p18 paragraph 3 and "IPv6 also defines encapsulation as a means to force a packet to take a different route. This is performed by enclosing the original packet as the payload of a new packet and by appending a new IPv6 Header specifying the new destination", p18 paragraph 6 lines 1-3).

Williams in view of Ernst however does not disclose, regarding claim 8, *transmitting said intermediary route messages to communication nodes that the extracting communication node serves.*

Baba discloses a "method, system, apparatus and product for providing dynamic registration and configuration of mobile clients in end to end wireless/wireline Internet Protocol (IP) networks" (col. 1 lines 12-16) comprising the above cited feature in **regarding to claim 8** that is missing from Williams in view of Ernst (see "DRCP_ADVERTISEMENT: Server periodically broadcasts (or unicast in response to a client using an incorrect addrerss) the network information (such as Server IP address or Network address). Listening to this, client can understand the subnet change", col. 4 lines 63-67).

It would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the method of Ernst by adding the route message broadcast means of Baba to Ernst in order to provide a more efficient system wherein “registration functionality would enable roaming mobile hosts to rapidly and automatically register their presence and their requirements with networks" (Baba, p3 lines 6-8).

7. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Williams in view of Ernst and further in view of Jinzaki (US 2001/0042070).

Regarding claim 28, Williams discloses the following features:

a method for building an extended binding cache for a data packet (“build a table of alternative routes", col. 8 line 9, and “each unique route taken by a packet is entered into a route ID table”, col. 8 lines 15-16) *on a communication path* ("over various types of communication channels”, col. 1 lines 17-18, and also fig. 1B, e.g., "route A") *from a first communication node* ("source node", col. 2 line 54, or fig. 1B "host 15") *to a second communication node* (“destination node”, col. 2 lines 55-56, or fig. 1B “host 20”) *in a network* (fig. 1A “internet 10"), *wherein the second communication node* (fig. 1B “host 20”) *is connected to the data network through at least one intermediary router* (it is obvious to one skilled in the art, referring to fig. 1B, that said "host 20" has to be *connected to the data network*, “internet 10”, *through intermediary routers* because it is communicating with “host 15” via various “route A, B, C, D, E” etc. as depicted in fig. 1B), *the method comprising the steps of:*

determining, by the second communication node (fig. 1B “host 20"), *a care-of route* (“echo route packet”, col. 4 line 24, and “unique routes could be derived from

routes obtained by using echo route packets", col. 8 lines 53-54) *including a list of addresses of the at least one intermediary router between said data network and said second communication node* ("when the echo route packet is received by the destination node, it is transmitted back to the source node", col. 8 lines 10-11, and see in fig. 5, which "illustrates an echo route packet which has traveled through a route and has recorded its intermediate node addresses and times", col. 4 lines 24-26, noting that said "intermediate node" comprises "routers" as recited col. 8 lines 17-18, "'strict source routing' in which the header lists all intermediate nodes (routers)", and see further that said echo route packet "include a list of nodes in sequence, that best determines the route over which the packet is transmitted", col. 8 lines 66-67);

sending, by the second communication node, an extended binging update message ("echo route packet") *to the first communication node without any explicit request for said route message being received by the said second communication node from the first communication node* ("the echo route packet is sent by the source node to the destination node (destination host server) to collect the node IDs along its route", col. 7 line 66 - col. 8 line 1, noting *said* "echo route packet" *being received by the* "destination node" *from the* "source node" *without any explicit request* by the "destination node" because it is the "source node" that proactively initiates the "echo route packet"), *wherein said route message* ("echo route packet") *includes the care-of route* (again see fig. 5) *for messages to reach said second communication node* ("the header of each packet is formatted by the source node to include a list of nodes in

sequence, that best determines the route over which the packet is transmitted", col. 8 lines 65-67);

receiving, from the second communication node ("the source node receives the echo route packet, it extracts the route", col. 8 lines 13-14)*, the extended binding update message* ("echo route packet") *indicating the intermediary addresses in the route* (fig. 5) *for message to reach said second communication node* ("the header of each packet is formatted by the source node to include a list of nodes in sequence, that best determines the route over which the packet is transmitted", col. 8 lines 65-67);

extracting at least one subsequent route of said second communication node ("When the source node receives the echo route packet, it extracts the route", col. 8 lines 13-14)*, thereby generating an extended binding cache entry* ("Each unique route taken by a packet is entered into a route ID table", col. 8 lines 15-16) *indicating a preferred route to said second communication node* ("The source node compares a number of returned echo packets which have been transmitted over different routes, to select the best available route", col. 3 line 14-17); *and*

transmitting said data packet ("packets use IP", col. 5 line 4) *from said first communication node to said second communication node* ("destination node", e.g. fig. 1B "host 20") *via said preferred communication path* (see fig. 1B depicting data routes between "host 15" and "host 20" and see the discussion immediately above for *preferred communication path* comprising "the best available route" among the routes in fig. 1B).

Williams does not disclose, regarding claim 28, *second node* in a *mobile* network and *intermediary routers* comprise a *mobile* router.

Ernst discloses a work "devoted to the study of network mobility support in IPv6" (Abstract line 1) comprising:

Regarding claim 28, a second node in a *mobile* network ("offer permanent and un-interrupted Internet connectivity and optima routing to all mobile network nodes, while scaling to a large number of correspondent nodes and a large number of mobile networks", p85 Chapter paragraph 1 lines 2-3, of which fig. 3.5 depicts an example of an "MN", mobile network, moving from its home address "MN_{IP}" to its care-of address "MN_{coa}"); and

intermediary routers comprise a *mobile* router (refer to fig. 7.5, "VMN" (visiting mobile node) registers with its "HA" (home agent) or "CN" (correspondent node) via an "MR" (mobile router), and receives message or "payload", fig. 7.6 message path 3, through the "MR").

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the network of Williams by adding the mobile network and associated mobile routers of Ernst to Williams in order to provide dynamic IP mobility wherein "anyone would benefit from the same social and professional environment without restriction of current geographical location" (Ernst, p.1 "Motivations and Objectives" 1st paragraph lines 3-4)

When disclosing receiving the extended binding update message ("echo route packet"), Williams in view of Ernst does not disclose *comparing* said intermediary

addresses ("intermediate node addresses") of said extended binding update message with *intermediary addresses, if any, of the first communication node's care-of route;* and said extracting subsequent route is performed *when said comparison fails to yield a match following previous route matches.*

Jinzaki discloses "information apparatus, table retrieval apparatus, table retrieval method, and recording medium" (Title) for "a path table" which "is a data base arranging network address and path information to reach a network address" ([0008] lines 1-2) comprising the above cited features missing from Williams in view of Ernst, particularly:

Regarding claim 28, *comparing* said intermediary addresses ("intermediate node addresses") of said extended binding update message with *intermediary addresses, if any, of the first communication node's care-of route;* and said extracting subsequent route is performed *when said comparison fails to yield a match following previous route matches* (see the steps of fig. 16, S30: "obtaining path information to be registered"; S31: "is the path information already registered in an existing table?"; S32 for the "No" leg of S31: "preparing a new table and registering the path information to be registered", and S33: "registering the pointer to a new table, in an entry of the existing table").

It would have been obvious to one of ordinary skill in the art at the time of the invention to further modify Williams by adding the route/path updating mechanism of Jinzaki to Williams in order to offer a more efficient and effective route finding method in order "to provide the data structure of a high-speed retrievable table with a small amount of memory and without an entry that is not used" (Jinzaki, [0039]).

8. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Williams in view of Ernst, as applied to claim 1 above, and further in view of Kajiwara (US 2002/0015386).

Williams in view of Ernst discloses claimed limitations in section 4 above including Williams disclosing, regarding claim 30, *wherein the sending step includes the second communication node sending the route message* (see the discussion for claim 1 wherein “destination node” sends “echo route packet" containing “intermediate node addresses” to "source node").

Williams in view of Ernst does not disclose such sending based on *when it* [second or “destination” node] *decides to trigger route optimization for an ongoing communication with the first communication node.*

Kajiwara discloses “a communication apparatus which effectively optimizes the route for each call connection” (Abstract lines 1-2) comprising:

Regarding claim 30, sending route message *when it* [second or “destination” node] *decides to trigger route optimization for an ongoing communication with the first communication node* (see in general "route optimization can be initiated not only at the calling end, but at the called end as well", [0036] lines 4-6, and in particular see fig. 11 depicting step S10 establishing an *ongoing communication* of *second node,* “ATM node 102”, *with the first communication node*, “ATM node 100”, and during this *ongoing communication*, previous connection was released, steps S11 – S14, and *route optimization* is performed through steps S15 – S19 wherein "ATM node 102", the *second node*, sends "CONN [Connection]" message containing new route information at

step S17 to "ATM node 100", the *first node*, and receives "CONN_ACK" at step S18 such that the *ongoing call* continues on the new route at step S19. See [0053] - [0063] for a detailed description of this *route optimization*).

It would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the method of Williams by adding the receiving node initiated route optimization method of Kajiwara to Williams in order to provide a better mechanism "which optimizes the route of each connection, without disrupting other existing call sessions and thus contributes to better quality and reliability of telecommunication service" (Kajiwara, [0009] lines 3-5).

9. Claims 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams in view of Ernst, as applied to claim 1 above, and further in view of Callon et al (US 5,854,899, Callon hereinafter).

Williams in view of Ernst discloses claimed limitations as discussed in section 2 above including Williams disclosing, regarding claim 31, *wherein the sending step includes the second communication node sending the route message* (see the discussion for claim 1 wherein "destination node" sends "echo route packet" containing "intermediate node addresses" to "source node").

Williams in view of Ernst does not disclose such sending based on *when it* [second or "destination" node] *detects that its care-of route has changed.*

Callon discloses "a system for managing virtual circuits and determining proper routing of packets in a network environment" (Abstract lines 1-2) comprising:

Regarding claim 31, sending route message *when it detects that its care-of route has changed* (refer to fig. 3 and see step 139: “network topology change detected?", of which the "Yes" leg eventually leads to step 148: "establish most beneficial new virtual circuit", noting “a network topology change includes addition, deletion, or rerouting of virtual circuits in the network. Furthermore, the addition of a new router of ATM switch, the addition of a link between a router and a switch, or the initialization of an existing router or switch represents a change in the network topology”, col. 6 lines 53-58).

Regarding claim 32, Williams discloses *wherein the care-of routes has changed due to the IP of one or more of its* ["destination" or *second* node's] *upper routers connecting it to the data network* (see fig. 1B depicting *care-of routes has changed*, e.g., route A *changes* to route C, etc., *due to the* change *of IP of one or more upper routers*, denoted as black dots therein, *connecting* "host 20” *to the data network* depicted as “internet 10” in fig. 1A). Williams does not but Ernst does disclose the IP *mobility* of the *mobile* router (see discussion for claim 1 above).

It would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the method of Williams by adding the topology/routing change detection method of Callon to Williams in order to offer a more robust mechanism that is able "to provide a system for managing virtual circuits in a manner that provides for efficient network operation" and "to determine when to use existing virtual circuits for forwarding packets to a destination, and when it is preferable to establish a new virtual circuit to the destination" (Callon, col. 2 lines 57-62).

Response to Arguments

10. Applicant's arguments filed on 2/12/2008 have been fully considered but they are not persuasive.

Applicant's arguments focus on the independent claims for the newly added feature, as underlined in the following, of "the second communication node sending a route message to the first communication node without any explicit request for said route message being received by the said second communication node from the first communication node, wherein said route message includes the care-of route". Applicant argues (Remarks page 9 third paragraph) "the second communication node sends a route message (care-of addresses) to the first communication node without any explicit request for said route message being received, although an explicit request is an option". Further, Applicant states (Remarks page 10 second paragraph), "In Williams … The list of intermediate addresses (forming the path) is only sent by the second node (destination node) to the first node (source node) in response to a request from the first node to the second node. … This is clearly different from applicants' invention, where the route message (containing the care-of route) can be (and is typically) sent proactively from the second node to the first node (i.e. without any request)"

Examiner respectfully disagrees.

First of all, it appears to the Examiner that the Applicant is arguing something that is different from what is claimed. Clearly, the claimed feature, see the above cited texts, is for "the second communication node" to send a route message "without any explicit request" for the route message being "received [earlier] by the second communication node", while Applicant's argument says that the "first node" is sending a

"request", which again clearly is not what is claimed. On the other hand, Williams clearly teaches that the destination node never requested for receiving such a route message ("echo route packet"). It is, as discussed in section 2 in detail, the source node that proactively sends the "echo route packet" to the destination node, which "echo route packet" picks up the address of the node at each hop it went through and insert the address into the "echo route packet" that is eventually fed back to the source node. Therefore, it is exactly the same as what is claimed.

Further, the argument for "where the route message (containing the care-of route) can be (and is typically) sent proactively from the second node to the first node (i.e. without any request)" is also not reflected in the claimed language, namely, the feature of "sent proactively".

Furthermore, Examiner would like to point out that, technically, the way the Applicant used to construct the care-of route is essentially the same as Williams. What the Applicant proposes is the following. A complete care-of route that is sent back to the source node by the destination node is constructed by the final destination node by adding its own care-of address to a list of addresses that the final destination received from some kind of advertisement message from all of its upstream node or mobile routers. In other words, the complete care-of route highly relies on the information a destination node receives from all upstream nodes, which traces all the back to the source node. In Williams, the final destination node obtains the complete list of addresses in essentially the same fashion by using an "echo route packet" that starts from the source node and picks up all the addresses of the nodes the packet traverses

and eventually the packet is received by the destination node which then construct the path and feeds back such path to the source node.

Additionally, Applicant made argument (Remarks page 10 third paragraph) on that "the method for computing the preferred path between Williams and applicant's invention are also different. In Williams, the first node will collect a list of possible paths to the second node associated with metrics (e.g. end-to-end delay) and will select the best path based on the metric. Note that Williams does not disclose any specific method to remove addresses from a received route to compute a path. On the other hand, applicant's invention discloses a method for the first node to compute the preferred path; possibly leading to the removal of some addresses of the care-of route received from the second node".

Again, Examiner respectfully points that such "removal of some addresses" is not a claimed limitation/feature and thus the argument is irrelevant. However, even if it is claimed, Williams comprises the same because Williams must, in selecting the best path, remove addresses that are not in the best path.

Finally, Applicant's arguments over Ernst and other references are all about those references' failing to compensate for the second node not sending any explicit request for said route message being received. Those arguments will not be addressed since Examiner has provided a response hereinabove for said newly added feature.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANDREW LAI whose telephone number is (571)272-9741. The examiner can normally be reached on M-F 7:30-5:00 EST, Off alternative Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang Yao can be reached on 571-272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Andrew Lai/
Examiner, Art Unit 2616

/Kwang B. Yao/

Supervisory Patent Examiner, Art Unit 2616